

WHAT IS CLAIMED IS:

1. A method of predicting a drug dose necessary to achieve a desired drug effect using patient clinical characteristics, comprising:
 - inputting to a computer neural network a first data set comprising drug dose data, drug effect data, and patient characteristics data for a plurality of patients;
 - training the computer neural network on the first data set; and
 - using the computer neural network to predict a drug dose for a specific patient given a desired drug effect and patient characteristics of the specific patient.
2. The method of claim 1, wherein the drug dose data concerns the drug abciximab and the drug effect data concerns the inhibition of adenosine diphosphate (ADP)-induced platelet aggregation.
3. The method of claim 1, wherein the computer neural network is a backpropagation neural network.
4. The method of claim 1, wherein the computer neural network uses a steepest descent learning rule.
5. The method of claim 1, wherein training the computer neural network comprises establishing a relationship between the drug effect data and corresponding drug dose data and patient characteristics data.
6. The method of claim 1, wherein the computer neural network:
 - receives drug dose data and patient characteristics data;
 - predicts a drug effect based on the drug dose data and the patient characteristics data;
 - compares the predicted drug effect to received drug effect data; and
 - adjusts a weight in the computer neural network based on a difference between the predicted drug effect and the received drug effect data.
7. The method of claim 1, further comprising validating the computer neural network using a second data set comprising drug dose data, drug effect data, and patient characteristics data for a plurality of patients.

8. The method of claim 7, wherein validating the computer neural network comprises:

inputting to the computer neural network the drug dose data and the patient characteristics data; and

comparing a predicted drug effect to the drug effect data corresponding to the inputted drug dose data and patient characteristics data.

9. The method of claim 1, wherein the drug dose data is a drug dose versus time signature and the drug effect data is a drug effect versus time signature.

10. The method of claim 1, wherein the patient characteristics data includes data concerning at least one of ethnicity, age, gender, weight, stable angina, presence of diabetes, blood pressure, use of nitrates, cholesterol level, use of a statin, use of a beta blocker, use of a calcium blocker, use of a diuretic, smoking history, and previous myocardial infarctions.

11. The method of claim 10, wherein the patient characteristics data includes data concerning weight, smoking history, and previous myocardial infarctions.

12. A computer-readable medium having thereon computer-readable instructions for performing the steps comprising:

receiving a first data set comprising drug dose data, drug effect data, and patient characteristics data for a plurality of patients;

establishing a relationship between the drug effect data, the drug dose data, and the patient characteristics data in a neural network; and

predicting a drug dose for a specific patient given a desired drug effect and patient characteristics of the specific patient.

13. The method of claim 12, wherein the drug dose data concerns the drug abciximab and the drug effect data concerns the inhibition of adenosine diphosphate (ADP)-induced platelet aggregation.

14. The method of claim 12, wherein the neural network is a backpropagation neural network.

15. The method of claim 12, wherein the neural network uses a steepest descent learning rule.

16. The method of claim 12, wherein establishing the relationship includes:
predicting a drug effect based on the drug dose data and the patient characteristics data;
comparing the predicted drug effect to received drug effect data; and
adjusting a weight in the neural network based on a difference between the predicted drug effect and the received drug effect data.

17. The method of claim 12, wherein the drug dose data is a drug dose versus time signature and the drug effect data is a drug effect versus time signature.

18. The method of claim 12, wherein the patient characteristics data includes data concerning at least one of ethnicity, age, gender, weight, stable angina, presence of diabetes, blood pressure, use of a nitrate, cholesterol level, use of a statin, use of a beta blocker, use of a calcium blocker, use of a diuretic, smoking history, and previous myocardial infarctions.

19. The method of claim 18, wherein the patient characteristics data includes data concerning weight, smoking history, and previous myocardial infarctions.

20. A method of predicting a drug dose necessary to achieve a desired drug effect using patient clinical characteristics, comprising:
inputting to a first computer neural network a first data set comprising drug dose data, drug effect data, and patient characteristics data for a plurality of patients;
training the first computer neural network on the first data set;
using the first computer neural network to generate a second data set comprising drug dose data, drug effect data, and patient characteristics data for a plurality of hypothetical patients;
inputting to a second neural network the second data set;
training the second neural network on the second data set; and
using the second neural network to predict a drug dose for a specific patient given a desired drug effect and patient characteristics of the specific patient.

21. The method of claim 20, wherein the first computer neural network and the second computer neural network are backpropagation neural networks.

22. The method of claim 20, wherein the first computer neural network and the second computer neural network use a steepest descent learning rule.

23. The method of claim 20, wherein training the first computer neural network comprises establishing a relationship between the drug effect data and corresponding drug dose data and patient characteristics data.

24. The method of claim 20, wherein the first computer neural network:
receives drug dose data and patient characteristics data;
predicts a drug effect based on the drug dose data and the patient characteristics data;
compares the predicted drug effect to received drug effect data; and
adjusts a weight in the first computer neural network based on a difference between the predicted drug effect and the received drug effect data.

25. The method of claim 24, wherein the second computer neural network:
receives drug effect data and patient characteristics data;
predicts a drug dose based on the drug effect data and the patient characteristics data;
compares the predicted drug dose to received drug dose data; and
adjusts a weight in the second computer neural network based on a difference between the predicted drug dose and the received drug dose data.

26. The method of claim 20, wherein training the second computer neural network comprises establishing a relationship between the drug dose data and corresponding drug effect data and patient characteristics data.

27. The method of claim 20, further comprising validating the first computer neural network using a third data set comprising drug dose data, drug effect data, and patient characteristics data for a plurality of patients.

28. The method of claim 27, wherein validating the first computer neural network comprises:
inputting to the first computer neural network the drug dose data and the patient characteristics data; and

comparing a predicted drug effect to the drug effect data corresponding to the inputted drug dose data and patient characteristics data.

29. The method of claim 20, further comprising validating the second computer neural network using a third data set comprising drug dose data, drug effect data, and patient characteristics data for a plurality of patients.

30. The method of claim 29, wherein validating the second computer neural network comprises:

inputting to the second computer neural network the drug effect data and the patient characteristics data; and

comparing a predicted drug dose to the drug dose data corresponding to the inputted drug effect data and patient characteristics data.

31. The method of claim 20, wherein the drug dose data is a drug dose versus time signature and the drug effect data is a drug effect versus time signature.

32. The method of claim 20, wherein the patient characteristics data includes data concerning at least one of ethnicity, age, gender, weight, stable angina, presence of diabetes, blood pressure, use of a nitrate, cholesterol level, use of a statin, use of a beta blocker, use of a calcium blocker, use of a diuretic, smoking history, and previous myocardial infarctions.

33. The method of claim 32, wherein the patient characteristics data includes data concerning weight, smoking history, and previous myocardial infarctions.

34. The method of claim 20, wherein the drug dose data concerns the drug abciximab and the drug effect data concerns the inhibition of adenosine diphosphate (ADP)-induced platelet aggregation.

35. The method of claim 20, further comprising training the second computer neural network on a fourth data set comprising drug dose data, drug effect data, and patient characteristics data for a plurality of patients.

36. The method of claim 20, wherein using the second neural network to predict a drug dose comprises inputting the desired drug effect data and the patient characteristics

and obtaining a predicted drug dose from the neural network that achieves the desired drug effect for the specific patient.

37. A computer-readable medium having thereon computer-readable instructions for performing the steps comprising:

- receiving a first data set comprising drug dose data, drug effect data, and patient characteristics data for a plurality of patients;

- establishing a relationship between the drug effect data, the drug dose data, and the patient characteristics data of the first data set in a first neural network;

- generating a second data set comprising drug dose data, drug effect data, and patient characteristics data for a plurality of hypothetical patients;

- establishing a relationship between the drug effect data, the drug dose data, and the patient characteristics data of the second data set in a second neural network; and

- predicting a drug dose for a specific patient given a desired drug effect and patient characteristics of the specific patient using the second neural network.

38. The method of claim 37, wherein the first neural network and the second neural network are backpropagation neural networks.

39. The method of claim 37, wherein the first neural network and the second neural network use a steepest descent learning rule.

40. The method of claim 37, wherein establishing the relationship in the first neural network includes:

- predicting a drug effect based on the drug dose data and the patient characteristics data;

- comparing the predicted drug effect to received drug effect data; and

- adjusting a weight in the first neural network based on a difference between the predicted drug effect and the received drug effect data.

41. The method of claim 37, wherein establishing the relationship in the second neural network includes:

- receiving drug effect data and patient characteristics data;

- predicting a drug dose based on the drug effect data and the patient characteristics data;

- comparing the predicted drug dose to received drug dose data; and

adjusting a weight in the second neural network based on a difference between the predicted drug dose and the received drug dose data.

42. The method of claim 37, wherein the drug dose data is a drug dose versus time signature and the drug effect data is a drug effect versus time signature.

43. The method of claim 37, wherein the patient characteristics data includes data concerning at least one of ethnicity, age, gender, weight, stable angina, presence of diabetes, blood pressure, use of a nitrate, cholesterol level, use of a statin, use of a beta blocker, use of a calcium blocker, use of a diuretic, smoking history, and previous myocardial infarctions.

44. The method of claim 43, wherein the patient characteristics data includes data concerning weight, smoking history, and previous myocardial infarctions.

45. The method of claim 37, wherein the drug dose data concerns the drug abciximab and the drug effect data concerns the inhibition of adenosine diphosphate (ADP)-induced platelet aggregation.

46. The method of claim 37, wherein predicting a drug dose comprises receiving the desired drug effect data and the patient characteristics and outputting a predicted drug dose from the second neural network that achieves the desired drug effect for the specific patient.